A separator for a fuel cell of the solid polymer electrolyte type or the phosphoric acid type that is a kind of fuel cell in which such energy conversion is conducted is desirably gas-impermeable, and also is made of an electrically conductive material. As a material meeting the requirements, conventionally, an electrically conductive resin is used. An electrically conductive resin is a complex which is configured by bonding graphite (carbon) powder by means of a thermosetting resin such as phenol resin, or a so-called bondcarbon (resin-bonded carbon) compound. A separator for a fuel cell is configured by forming such a bondcarbon compound into a predetermined shape.

A1 Contd

Conventionally, a separator for a fuel cell having a predetermined shape is formed by using such a bondcarbon compound in the following manner. With respect to the composition ratio of a thermosetting resin such as phenol resin and graphite powder, 25 to 40 wt.% of the thermosetting resin is--

Please amend the last paragraph on page 3 as follows:

--In order to improve the conductivity of a separator for a fuel cell which is configured by using a bondcarbon compound, it is contemplated that the content of a thermosetting resin be reduced as far as possible, and graphite powder of excellent crystallinity and having less impurities such as ash is selectively used. When the content of a thermosetting resin is reduced, however, elongation and fluidity of the bondcarbon compound during a molding process are lowered, and moldability is impaired. In order to improve the conductivity of a separator, furthermore, it is required to use graphite powder of excellent crystallinity. However, graphite powder of excellent crystallinity is usually poor in wettability and bondability to a resin. When graphite powder of excellent crystallinity is used, therefore, a larger resin content is required. As a result, a uniform

A2

A2 Contd

separator is obtained more hardly as the resin content is smaller.--

Please amend the first, second and third paragraphs on page 5 as follows:

--tion to provide a separator for a fuel cell which can be formed into a uniform and predetermined shape while good conductivity is ensured by reducing the resin content so as to suppress the volume resistivity to 1 x 10^{-2} Ω·cm or lower.--

--It is another object of the invention to provide a method of producing a separator for a fuel cell wherein, even when a molding material in which the resin content is small, and which is therefore low in elongation and fluidity is used, the molding material can extend to every corner of a mold so that the separator having a uniform and correct shape that is free from molding unevenness, and good conductivity can be surely produced.--

A3

--In order to attain the objects, the separator for a fuel cell of the invention is a separator for a fuel cell consisting of a complex which is configured by bonding graphite powder by means of a thermosetting resin, and characterized in that, in the complex, a composition ratio of the graphite powder is set to 85 to 97 wt.%, a composition ratio of the thermosetting resin is set to 3 to 15 wt.%, an average particle diameter of the graphite powder is set to a range of 15 to 125 μm, and the complex is molded at a pressure of 10 to 100 MPa.--

Please amend page 6 as follows:

--range of 40 to 100 μm. Preferably, the molding pressure of the complex is set to a range of 20 to 50 MPa.

A4

In order to meet the above-mentioned demands for development, intensive studies on a separator for a fuel cell which is configured by using a bondcarbon compound, and finally found that the volume resistivity serving as an element which largely affects the performance of a fuel

cell is determined not only by the composition ratios of a resin and graphite powder, but also by the average diameter of the graphite powder, and the molding pressure, and that the size of the average diameter of the graphite powder is closely related not only to the volume resistivity, but also to the fluidity, moldability, and strength of the compound. Based on this finding, the composition ratios of a resin and graphite powder, the average diameter of the graphite powder, and the molding pressure have been respectively set to the above-mentioned ranges, thereby completing the invention.

A4 Cont'd

According to the thus configured invention, as the graphite powder which is the one composition of the complex and which largely affects the volume resistivity, graphite powder in which the average diameter is set to a range of 15 to 125 μm, preferably, 40 to 100 μm is used, the thermosetting resin which is the other composition of the complex, and which largely affects fluidity, modability, and--

Please amend the second paragraph on page 9 as follows:

--In the separator for a fuel cell and the method of producing a separator for a fuel cell according to the invention, particularly, it is preferable to set the molding pressure of the complex to a range of 20 to 50 MPa. The molding pressure, and the mold density and the volume resistivity have the correlation shown in Fig. 5. At a molding pressure in a range of 5 to 10 MPa which is usually used in the conventional art, both the mold density and the volume resistivity fail to reach values which are required in a separator for a fuel cell. By contrast, when the molding pressure is set to a range of 20 to 50 MPa, both the mold density and the volume resistivity are stabilized to substantially constant values. When the molding pressure is set to 20 MPa at the minimum, it is possible to obtain a separator of good conductivity.--

A5

Please amend the second complete paragraph on page 10 as follows:

--As the graphite powder which is useful in the invention, powder of graphite of any kind, including natural graphite, artificial graphite, carbon black, kish graphite, and expanded graphite may be used. In consideration of conditions such as cost, the kind can be arbitrarily selected. In the case where expanded graphite is used, particularly, a layer structure is formed by expanding the volume of the graphite as a result of heating. When the molding pressure is applied, layers can twine together to be firmly bonded to one another. Therefore, expanded graphite is effective in a complex in which the ratio of a thermosetting resin is to be reduced.--

A6

Please amend the fourth and fifth paragraphs on page 11 as follows:

--Fig. 4A is a view illustrating a step of producing the separator, and Fig. 4B is a view illustrating the manner of production; and--

A7

--Fig. 5 is a view showing the correlation between the molding pressure, the volume resistivity and the mold density in the production of a separator according to a second embodiment.--

Please amend the first paragraph on page 12 as follows:

--stack structure in which plural unit cells 5 are stacked and collector plates (not shown) are respectively placed on both ends. Each of the unit cells 5 is configured by: an electrolyte membrane 1 which is an ion exchange membrane made of, for example, a fluororesin; an anode 2 and a cathode 3 which are formed by carbon cloth woven of carbon filaments, carbon paper, or carbon felt, and which sandwich the electrolyte membrane 1 to constitute a gas diffusion electrode having a sandwich structure; and separators 4 which sandwich the sandwich structure.--

A8